Health Facilities Scotland

NHS National Services Scotland

STATUS IN NHSSCOTLAND

BEST PRACTICE GUIDANCE

Health Building Note 04-02

Critical care units

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This document must be read in conjunction with current Scottish Government Policy and NHSScotland Guidance, which take precedence. These include publications in both: www.sehd.scot.nhs.uk/ and www.hfs.scot.nhs.uk/publications-/ .

Specific updates for NHSScotand use:

Chapter No

Para No.

Department of Health

Health Building Note 04-02
Critical care units

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Preface

About Health Building Notes

Health Building Notes give "best practice" guidance on the design and planning of new healthcare buildings and on the adaptation/extension of existing facilities.

They provide information to support the briefing and design processes for individual projects in the NHS building programme.

The Health Building Note suite

Healthcare delivery is constantly changing, and so too are the boundaries between primary, secondary and tertiary care. The focus now is on delivering healthcare closer to people's homes.

The Health Building Note framework (shown below) is based on the patient's experience across the spectrum of care from home to healthcare setting and back, using the national service frameworks (NSFs) as a model.

Health Building Note structure

The Health Building Notes have been organised into a suite of 17 core subjects.

Care-group-based Health Building Notes provide information about a specific care group or pathway but cross-refer to Health Building Notes on **generic (clinical) activities** or **support systems** as appropriate.

Core subjects are subdivided into specific topics and classified by a two-digit suffix (-01, -02 etc), and may be further subdivided into Supplements A, B etc.

All Health Building Notes are supported by the overarching Health Building Note 00 in which the key areas of design and building are dealt with.

Example

The Health Building Note on accommodation for adult in-patients is represented as follows:

> "Health Building Note 04-01: Adult in-patient facilities"

The supplement to Health Building Note 04-01 on isolation facilities is represented as follows:

> "Health Building Note 04-01: Supplement 1 – Isolation facilities for infectious patients in acute settings"

Health Building Note number and series title	Type of Health Building Note
Health Building Note 00 – Core elements	Support-system-based
Health Building Note 01 – Cardiac care	Care-group-based
Health Building Note 02 – Cancer care	Care-group-based
Health Building Note 03 – Mental health	Care-group-based
Health Building Note 04 – In-patient care	Generic-activity-based
Health Building Note 05 – Older people	Care-group-based
Health Building Note 06 – Diagnostics	Generic-activity-based
Health Building Note 07 – Renal care	Care-group-based
Health Building Note 08 – Long-term conditions/long-stay care	Care-group-based
Health Building Note 09 – Children, young people and maternity services	Care-group-based
Health Building Note 10 – Surgery	Generic-activity-based
Health Building Note 11 – Community care	Generic-activity-based
Health Building Note 12 – Out-patient care	Generic-activity-based
Health Building Note 13 – Decontamination	Support-system-based
Health Building Note 14 – Medicines management	Support-system-based
Health Building Note 15 – Emergency care	Care-group-based
Health Building Note 16 – Pathology	Support-system-based

Other resources in the DH Estates and Facilities knowledge series

Health Technical Memoranda

Health Technical Memoranda give comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology used in the delivery of healthcare (for example medical gas pipeline systems, and ventilation systems).

They are applicable to new and existing sites, and are for use at various stages during the inception, design, construction, refurbishment and maintenance of a building.

All Health Building Notes should be read in conjunction with the relevant parts of the Health Technical Memorandum series.

Activity DataBase (ADB)

The Activity DataBase (ADB) data and software assists project teams with the briefing and design of the healthcare environment. Data is based on guidance given in the Health Building Notes, Health Technical Memoranda and Health Technical Memorandum Building Component series.

1. Room data sheets provide an activity-based approach to building design and include data on personnel, planning relationships, environmental considerations, design character, space requirements and graphical layouts.
2. Schedules of equipment/components are included for each room, which may be grouped into ergonomically arranged assemblies.
3. Schedules of equipment can also be obtained at department and project level.
4. Fully loaded drawings may be produced from the database.
5. Reference data is supplied with ADB that may be adapted and modified to suit the users' project-specific needs.

Note

The sequence of numbering within each subject area does not necessarily indicate the order in which the Health Building Notes were or will be published/printed. However, the overall structure/number format will be maintained as described.

Executive summary

This Health Building Note provides guidance on critical care units that admit patients whose dependency levels are classified as level 2 or 3 (see 'Comprehensive Critical Care', DH 2000, for definitions of levels of critical care). However, it does not distinguish between the different requirements for level 2 and 3 patients.

It excludes facilities for the high-security isolation of patients, dedicated centres for burns patients and areas within the hospital where level 2 or 3 patients are managed on a time-limited basis.

Contents

1 Policy context

1.1 'Comprehensive Critical Care' (DH, 2000) was a pivotal publication. It introduced the concept of "critical care without walls"; identifying for the first time that a patient's clinical needs and not their location of care determined the required level and type of organ support. Patients thereafter have been described according to their required level of organ support (see levels of care on the Intensive Care Society website).

1.2 In addition 'Comprehensive Critical Care' highlighted the need for early recognition of deteriorating health and appropriate comprehensive transfer arrangements for patients to wards after recovery from critical illness. These concepts and guidance on operational service delivery such as the role of critical care networks were reinforced in 'Quality Critical Care – Beyond Comprehensive Critical Care' (DH, 2005).

1.3 NICE has subsequently issued guidance on 'Acutely ill patients in hospital' (Clinical guidelines CG50, July 2007) and 'Rehabilitation after critical illness' (Clinical guidelines CG83, 2009). Accompanying CG50, 75 acute care competencies have been detailed in 'Competencies for recognising and responding to acutely ill patients in hospital' (DH, 2009). Such guidance has led to the development of critical care outreach services.

1.4 The operational changes that have followed the release of 'Comprehensive Critical Care' have been significant. Critical care networks have developed, many of which are delivered now as managed clinical networks. The provision of mutual and collective planning of services is essential for service resilience. This means that critical care units across a conurbation will work together to meet needs.

1.5 The building blocks for commissioning of critical care services are now in place. A new dataset, Critical Care Minimum Dataset, was mandated from April 2006; annual reference cost submission followed and from 1 April 2011 a new model for commissioning of critical care services has been used. This model uses the mandated dataset and derivation of seven healthcare resources groups for critical care as the currency, but uses local tariffs ('Payment by Results Guidance for 2011–12', DH).

Mixed-sex accommodation in critical care units

1.6 Patient acuity determines the need for access to critical care, and although every effort is made to group members of the same sex together, this is frequently not possible. Nevertheless, it is imperative that the highest standards of privacy and dignity are maintained at all times.

1.7 For guidance on the justification for mixed sex accommodation in critical care units see PL/CNO/2010/3 – 'Eliminating Mixed Sex Accommodation'.

2 Service context

2.1 The Department of Health collects data on the number of critical care beds twice a year. For details see 'Census on number of critical care beds in England'.

3 Scope of guidance

3.1 This Health Building Note describes spaces that are unique to a critical care unit. It also describes any variations to common hospital spaces and clarifies requirements for these spaces, where necessary.

3.2 For a full list of space requirements see the following example schedules of accommodation for an 8-bed, 16-bed and 32-bed critical care unit. The example schedules provide a basis for sizing facilities at initial planning stages but exact requirements should be determined locally based on the number and case mix of patients, hospital policy for the provision of supplies and waste disposal, and the layout of the unit. Links to guidance on common spaces are provided from the schedules.

Example schedules of accommodation for critical care units								
Version 1, published 15.09.11								
				Cost guide allowances:	**Circulation and communication**	**Engineering**		
				Public	35%	23%		
				Clinical	35%	35%		
				Staff	35%	21%		
Example 1: 8-bed critical care unit								
	Room name/function	**Unit area allowance**	**Quantity**	**Net internal area**	**Circulation and communication allowance**	**Engineering allowance**	**Gross internal area**	**Notes**
Public spaces								
	Entrance: visitors		1					
	Entrance: patients, staff and supplies		1					Separate entrance for staff and supplies is an option.
J0232	Reception desk (size based on number of places)	5.5	1	5.5	1.9	1.3	8.7	1-place reception for small/medium sized units; 2-place reception for large units (>30 beds).
J1155/J1414	Waiting area: 10 places	22.5	1	22.5	7.9	5.2	35.6	Includes children's play area and 10% wheelchair places. 1 place per bed with minimum of 10.
P0711	Mini kitchen	5.0	1	5.0	1.8	1.2	7.9	1 per unit.
	WC: independent wheelchair	4.5	1	4.5	1.6	1.0	7.1	1 per small/medium sized unit; 2 per large unit (>30 beds).
Clinical spaces								
T0214-03	Staff communication base: 2 places	13.0	1	13.0	4.6	4.6	22.1	2 places per 8 beds.
B1603	Isolation room: critical care	26.0	4	104.0	36.4	36.4	176.8	Planning and design manual specifies 20% singles (subject to case mix); in an 8-bed unit with a standard 4-bed bay arrangement 50% singles may be provided.
G0510	Gowning lobby	6.0	4	24.0	8.4	8.4	40.8	
B1610	4-bed bay: critical care	143.0	1	143.0	50.1	50.1	243.1	
M0727	Interview room: 7 places	12.0	1	12.0	4.2	4.2	20.4	1 per 10 beds.
V1635	Shower room: assisted	8.0	1	8.0	2.8	2.8	13.6	Nominal allowance. Requirement subject to case mix of unit.
Clinical support spaces								
T0535	Clean utility room	16.0	1	16.0	5.6	5.6	27.2	1 per 12 beds.
G0605	Ice-making machine bay	1.5	1	1.5	0.5	0.5	2.6	1 per unit.
L1308	Near patient testing room	8.0	1	8.0	2.8	2.8	13.6	1 per 16 beds.
Y0331	Dirty utility room for bedpan processing	12.0	1	12.0	4.2	4.2	20.4	1 per 16 beds.
P0627	Pantry/refreshment room	12.0	1	12.0	4.2	4.2	20.4	1 per unit.
W0540/1450/ 1590/1594	Storage: bulky consumables, medical gas cylinders, linen and furniture	4.0	8	32.0	11.2	11.2	54.4	4 m^2 allowance per bed. Based on a review of a number of reference sites.
W1584-06	Store: clinical equipment	24.0	1	24.0	8.4	8.4	40.8	1 for small/medium sized units; 2 for large units (>30 beds).
Y0335	Decontamination room: clinical equipment	16.0	1	16.0	5.6	5.6	27.2	1 per unit. Located adjacent to clinical equipment store.
G0171	Parking bay: imaging equipment	6.0	1	6.0	2.1	2.1	10.2	1 per small/medium sized unit; 2 per large unit (>30 beds).
G0180-01	Parking bay: resuscitation trolley	2.0	1	2.0	0.7	0.7	3.4	1 per 8 beds.
Y0642	Disposal hold: 1700 litres	8.0	1	8.0	2.8	2.8	13.6	Minimum 1500 litres per 8 beds
Y1510	Cleaners' room	8.0	1	8.0	2.8	2.8	13.6	1 for small/medium sized units; 2 for large units (>30 beds).
Staff spaces								
M0251	Office: 1-person	8.0	3	24.0	8.4	5.0	37.4	For clinical director, lead nurse and tutor.
M0278-01/M0281/ M0410/M0731	Admin area: shared use (size based on number of workstations)	6.6	5	33.0	11.6	6.9	51.5	For consultants and outreach staff.
M0727	Meeting room: 7 places	16.0	1	16.0	5.6	3.4	25.0	
H1304-01	Seminar room: 8 places	17.0	1	17.0	6.0	3.6	26.5	May be sized up and shared with other departments.
D0434-01	Rest room with mini kitchen (size based on number of seats)	1.9	8	15.2	5.3	3.2	23.7	
V0554-03/V0667-01/ V0725/V1321	Changing area: staff (size based on number of lockers)	1.4	35	49.0	17.2	10.3	76.4	Includes uniform exchange area, showers and a number of individual changing rooms. Based on 32 staff who need a locker (allowing for shift changeover), plus a 10% contingency to allow for male/female split (suggested apportionment 2/3 female to 1/3 male).
V0725	Changing room: semi-ambulant	2.0	1	2.0	0.7	0.4	3.1	Additional individual changing room to allow for male and female segregation.
V1321	Shower room: ambulant	2.5	1	2.5	0.9	0.5	3.9	Additional shower room to allow for male and female segregation.
V1010	WC: ambulant	2.0	4	8.0	2.8	1.7	12.5	Serving up to 50 staff, with additional WC to allow for gender segregation.
Total allowance				**653.7**	**228.8**	**201.0**	**1083.5**	
Optional accommodation								
W0652	Blood refrigerator bay	2.0	1	2.0				Only required if blood storage not available nearby.
L1804-03	Service room: clinical equipment	12.0	1	12.0				Only required if biomedical engineering workshop not available nearby.
G0171-02	Parking bay: mobile image intensifier	2.0	1	2.0				
P0808	Vending machine	3.0	1	3.0				In lieu of visitors' mini kitchen.
D1120	Sitting room: 7 places	12.0	1	12.0				For visitors.
D1312	Relatives' overnight stay	17.0	1	17.0				For visitors. Requirement based on case mix of patients.
V1323	Shower room: semi-ambulant: standing use	5.0	2	10.0				For visitors. Requirement based on case mix of patients.

Example schedules of accommodation for critical care units								
Version 1, published 15.09.11								
				Cost guide allowances:	Circulation and communication	Engineering		
				Public	35%	23%		
				Clinical	35%	35%		
				Staff	35%	21%		
Example 2: 16-bed critical care unit								
	Room name/function	Unit area allowance	Quantity	Net internal area	Circulation and communication allowance	Engineering allowance	Gross internal area	Notes
Public spaces								
	Entrance: visitors		1					
	Entrance: patients, staff and supplies		1					Separate entrance for staff and supplies is an option.
J0232	Reception desk (size based on number of places)	5.5	1	5.5	1.9	1.3	8.7	1-place reception for small/medium sized units; 2-place reception for large units (>30 beds).
J1155/J1414	Waiting area: 16 places	33.0	1	33.0	11.6	7.6	52.1	Includes children's play area and 10% wheelchair places. 1 place per bed with minimum of 10.
P0711	Mini kitchen	5.0	1	5.0	1.8	1.2	7.9	1 per unit.
V0922	WC: independent wheelchair	4.5	1	4.5	1.6	1.0	7.1	1 per small/medium sized unit; 2 per large unit (>30 beds).
Clinical spaces								
T0214	Staff communication base: 4 places	19.0	1	19.0	6.7	6.7	32.3	2 places per 8 beds.
B1603	Isolation room: critical care	26.0	4	104.0	36.4	36.4	176.8	Planning and design manual specifies 20% singles (subject to case mix); in a 16-bed unit with a standard 4-bed bay arrangement 25% singles may be provided.
G0510	Gowning lobby	6.0	4	24.0	8.4	8.4	40.8	
B1610	4-bed bay: critical care	143.0	3	429.0	150.2	150.2	729.3	
M0727	Interview room: 7 places	12.0	2	24.0	8.4	8.4	40.8	1 per 10 beds.
V1635	Shower room: assisted	8.0	1	8.0	2.8	2.8	13.6	Nominal allowance. Requirement subject to case mix of unit.
Clinical support spaces								
T0535	Clean utility room	16.0	2	32.0	11.2	11.2	54.4	1 per 12 beds.
G0605	Ice-making machine bay	1.5	1	1.5	0.5	0.5	2.6	1 per unit.
L1308	Near patient testing room	8.0	1	8.0	2.8	2.8	13.6	1 per 16 beds.
Y0331	Dirty utility room for bedpan processing	12.0	1	12.0	4.2	4.2	20.4	1 per 16 beds.
P0627	Pantry/refreshment room	12.0	1	12.0	4.2	4.2	20.4	1 per unit.
W0540/1450/ 1590/1594	Storage: bulky consumables, medical gas cylinders, linen and furniture	4.0	16	64.0	22.4	22.4	108.8	4 m^2 allowance per bed. Based on a review of a number of reference sites.
W1584-06	Store: clinical equipment	24.0	1	24.0	8.4	8.4	40.8	1 for small/medium sized units; 2 for large units (>30 beds).
Y0335	Decontamination room: clinical equipment	16.0	1	16.0	5.6	5.6	27.2	1 per unit. Located adjacent to clinical equipment store.
G0171	Parking bay: imaging equipment	6.0	1	6.0	2.1	2.1	10.2	1 per small/medium sized unit; 2 per large unit (>30 beds)
G0180-01	Parking bay: resuscitation trolley	2.0	2	4.0	1.4	1.4	6.8	1 per 8 beds.
Y0646	Disposal hold: 3000 litres	12.0	1	12.0	4.2	4.2	20.4	Minimum 1500 litres per 8 beds.
Y1510	Cleaners' room	8.0	1	8.0	2.8	2.8	13.6	1 for small/medium sized units; 2 for larger units (>30 beds).
Staff spaces								
M0251	Office: 1-person	8.0	3	24.0	8.4	5.0	37.4	For clinical director, lead nurse and tutor.
M0278/M0281/ M0410/M0731	Admin area: shared use (size based on number of workstations)	6.6	13	85.8	30.0	18.0	133.8	For consultants and outreach staff.
M0727	Meeting room: 7 places	16.0	1	16.0	5.6	3.4	25.0	
H1304-02	Seminar room: 16 places	26.0	1	26.0	9.1	5.5	40.6	
D0434-03	Rest room with mini kitchen (size based on number of seats)	1.9	16	30.4	10.6	6.4	47.4	
V0554-03/V0667/ V0725/V1321	Changing area: staff (size based on number of lockers)	1.4	77	107.8	37.7	22.6	168.2	Includes uniform exchange area, showers and a number of individual changing rooms. Based on 70 staff who need a locker (allowing for shift changeover), plus a 10% contingency to allow for male/female split (suggested apportionment 2/3 female to 1/3 male).
V0725	Changing room: semi-ambulant	2.0	1	2.0	0.7	0.4	3.1	Additional individual changing room to allow for male and female segregation.
V1321	Shower room: ambulant	2.5	1	2.5	0.9	0.5	3.9	Additional shower room to allow for male and female segregation.
V1010	WC: ambulant	2.0	5	10.0	3.5	2.1	15.6	Serving up to 75 staff, with additional toilet to allow for gender segregation.
Total allowance				**1160.0**	**406.0**	**357.6**	**1923.6**	
Optional accommodation								
W0652	Blood refrigerator bay	2.0	1	2.0				Only required if blood storage not available nearby.
L1804-03	Service room: clinical equipment	12.0	1	12.0				Only required if biomedical engineering workshop not available nearby.
G0171-02	Parking bay: mobile image intensifier	2.0	1	2.0				
P0808	Vending machine	3.0	1	3.0				In lieu of visitors' mini kitchen.
D1120	Sitting room: 7 places	12.0	1	12.0				For visitors.
D1312	Relatives' overnight stay	17.0	1	17.0				For visitors. Requirement based on case mix of patients.
V1323	Shower room: semi-ambulant: standing use	5.0	2	10.0				For visitors. Requirement based on case mix of patients.

Example schedules of accommodation for critical care units								
Version 1, published 15.09.11								
				Cost guide allowances:	Circulation and communication	Engineering		
				Public	35%	23%		
				Clinical	35%	35%		
				Staff	35%	21%		
Example 3: 32-bed critical care unit								
	Room name/function	Unit area allowance	Quantity	Net internal area	Circulation and communication allowance	Engineering allowance	Gross internal area	Notes
Public spaces								
	Entrance: visitors		1					
	Entrance: patients, staff and supplies		1					Separate entrance for staff and supplies is an option.
J0232	Reception desk (size based on number of places)	5.5	2	11.0	3.9	2.5	17.4	1-place reception for small/medium sized units; 2-place reception for large units (>30 beds).
J1155/J1414	Waiting area: 32 places	60.0	1	60.0	21.0	13.8	94.8	Includes children's play area and 10% wheelchair places. 1 place per bed with minimum of 10.
P0711	Mini kitchen	5.0	1	5.0	1.8	1.2	7.9	1 per unit.
V0922	WC: independent wheelchair	4.5	2	9.0	3.2	2.1	14.2	1 per small/medium sized unit; 2 per large unit (>30 beds).
Clinical spaces								
T0214-02	Staff communication base: 8 places	30.0	1	30.0	10.5	10.5	51.0	2 places per 8 beds.
B1063	Isolation room: critical care	26.0	8	208.0	72.8	72.8	353.6	Planning and design manual specifies 20% singles (subject to case mix); in a 32-bed unit with a standard 4-bed bay arrangement 25% singles may be provided.
G0510	Gowning lobby	6.0	8	48.0	16.8	16.8	81.6	
B1610	4-bed bay: critical care	143.0	6	858.0	300.3	300.3	1458.6	
M0727	Interview room: 7 places	12.0	3	36.0	12.6	12.6	61.2	1 per 10 beds.
V1635	Shower room: assisted	8.0	2	16.0	5.6	5.6	27.2	Nominal allowance. Requirement subject to case mix of unit.
Clinical support spaces								
T0535	Clean utility room	16.0	3	48.0	16.8	16.8	81.6	1 per 12 beds.
G0605	Ice-making machine bay	1.5	1	1.5	0.5	0.5	2.6	1 per unit.
L1308	Near patient testing room	8.0	2	16.0	5.6	5.6	27.2	1 per 16 beds.
Y0331	Dirty utility room for bedpan processing	12.0	2	24.0	8.4	8.4	40.8	1 per 16 beds.
P0627	Pantry/refreshment room	12.0	1	12.0	4.2	4.2	20.4	1 per unit.
W0540/1450/ 1590/1594	Storage: bulky consumables, medical gas cylinders, linen and furniture	4.0	32	128.0	44.8	44.8	217.6	4 m^2 allowance per bed. Based on a review of a number of reference sites.
W1584-06	Store: clinical equipment	24.0	2	48.0	16.8	16.8	81.6	1 for small/medium sized units; 2 for large units (>30 beds).
Y0335	Decontamination room: clinical equipment	16.0	1	16.0	5.6	5.6	27.2	1 per unit. Located adjacent to clinical equipment stores.
G0171	Parking bay: imaging equipment	6.0	2	12.0	4.2	4.2	20.4	1 per small/medium sized unit; 2 per large unit (>30 beds)
G0180-01	Parking bay: resuscitation trolley	2.0	4	8.0	2.8	2.8	13.6	1 per 8 beds.
Y0646	Disposal hold: 3000 litres	12.0	2	24.0	8.4	8.4	40.8	Minimum 1500 litres per 8 beds.
Y1510	Cleaners' room	8.0	2	16.0	5.6	5.6	27.2	1 for small/medium sized units; 2 for larger units (>30 beds).
Staff spaces								
M0251	Office: 1-person	8.0	3	24.0	8.4	5.0	37.4	For clinical director, lead nurse and tutor.
M0278/M0281/ M0410/M0731	Admin area: shared use (size based on number of workstations)	6.6	29	191.4	67.0	40.2	298.6	For consultants and outreach staff.
M0727	Meeting room: 7 places	16.0	1	16.0	5.6	3.4	25.0	
H1304-03	Seminar room: 32 places	45.0	1	45.0	15.8	9.5	70.2	
D0434-03	Rest room with mini kitchen (size based on number of seats)	1.8	32	57.6	20.2	12.1	89.9	
V0554-03/V0667-02/ V0725/V1321	Changing area: staff (size based on number of lockers)	1.4	148	207.2	72.5	43.5	323.2	Includes uniform exchange area, showers and a number of individual changing rooms. Based on 135 staff who need a locker (allowing for shift changeover), plus a 10% contingency to allow for male/female split (suggested apportionment 2/3 female to 1/3 male).
V0725	Changing room: semi-ambulant	2.0	2	4.0	1.4	0.8	6.2	Additional individual changing rooms to allow for male and female segregation.
V1321	Shower room: ambulant	2.5	2	5.0	1.8	1.1	7.8	Additional shower rooms to allow for male and female segregation.
V1010	WC: ambulant	2.0	8	16.0	5.6	3.4	25.0	Serving up to 150 staff, with additional toilet to allow for gender segregation.
Total allowance				**2200.7**	**770.2**	**680.8**	**3651.7**	
Optional accommodation								
W0652	Blood refrigerator bay	2.0	1	2.0				Only required if blood storage not available nearby.
L1804-03	Service room: clinical equipment	12.0	1	12.0				Only required if biomedical engineering workshop not available nearby.
G0171-02	Parking bay: mobile image intensifier	2.0	1	2.0				
P0808	Vending machine	3.0	1	3.0				In lieu of visitors' mini kitchen.
D1120	Sitting room: 7 places	12.0	1	12.0				For visitors.
D1312	Relatives' overnight stay	17.0	1	17.0				For visitors. Requirement based on case mix of patients.
V1323	Shower room: semi-ambulant: standing use	5.0	2	10.0				For visitors. Requirement based on case mix of patients.

4 Whole unit planning and design considerations

Departmental relationships

4.1 A critical care unit should be centrally located within an acute hospital development. It should be adjacent to and/or have easy access to (and be easily accessible from) imaging facilities and operating theatres. The emergency department should be adjacent and/or have easy access to the critical care unit.

4.2 The critical care unit requires close links to the main hospital pharmacy and microbiology laboratory; where a pneumatic tube system is used to transport specimens and computers are used for transmitting test results and placing prescription orders, physical proximity is less important.

Bed spaces

4.3 Each bed space should include the following:

- an electric bed capable of attaining chair and Trendelenberg positions, and fitted with a pressure-relieving mattress;
- a high-backed chair with foot elevation and tilting facility for the patient;
- a ceiling-mounted twin-armed pendant to accommodate a range of equipment and for the provision of medical gases and electrical and data connectivity;
- a clinical wash-hand basin;

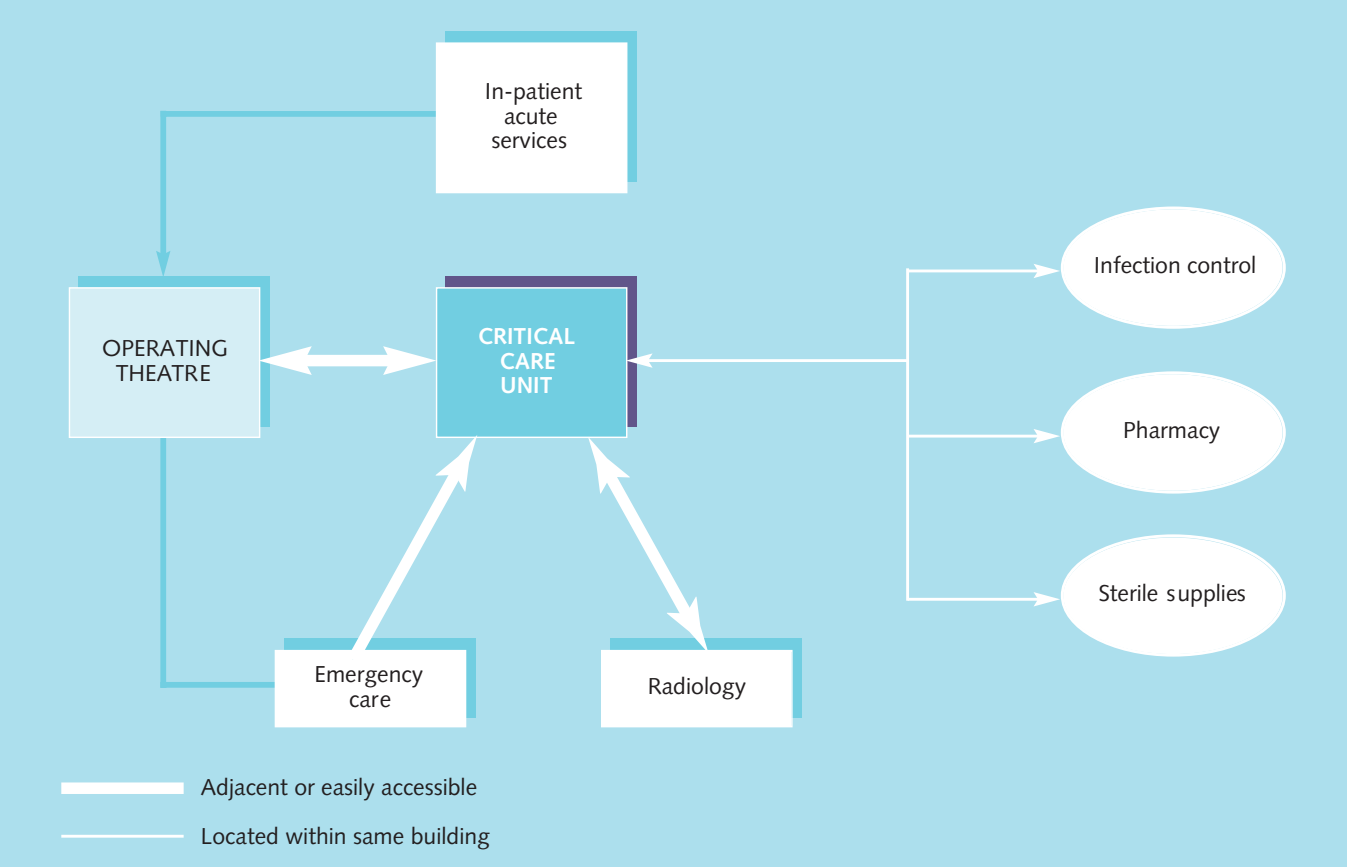

Figure 1 Departmental relationships for a critical care unit

- enclosed storage for a small quantity of consumables;
- drugs storage (wall-mounted drugs cabinet or within the patient's bedside locker);
- a ceiling-mounted hoist for lifting patients.

4.4 Storage of patients' clothes and personal effects should be dealt with in accordance with whole-hospital policy. They should not normally be kept at the bedside; however, some personal items such as family photographs can help the patient's orientation and provide emotional support.

4.5 The following outlets should be located on the pendant:

- at least 28 unswitched single socket-outlets;
- up to four data outlets, one of which should be networked to the hospital's patient record system;
- 3–4 oxygen outlets;
- two 4-bar air outlets;
- one 7-bar air outlet (where surgical equipment is used), clearly labelled with the appropriate warning;
- 2–4 medical vacuum outlets;
- anaesthetic gas scavenging points, if anaesthetic inhalation gases and/ or inhalation antibiotics are used;
- patient/staff and staff emergency call systems, including a separate switch for crash call;
- telephone outlet for internal and external calls;
- TV outlet.

4.6 The following equipment should be located on the pendant:

- computer with flat-screen monitor;
- multi-parameter patient monitoring equipment;
- 3–6 infusion pumps;
- 4–10 syringe pumps;
- blood warmer;
- feeding pump;
- ventilation and humidification equipment.

4.7 Ceiling-mounted rather than floor-mounted pendants are recommended since they avoid the need to trail cables across the floor, thereby providing better access to the patient and improved safety for staff and visitors. They are also easier to keep clean. Powered ceiling-mounted pendants enable staff of all heights to operate them easily. Care should be taken in the positioning of the pendants to ensure convenient access by staff.

4.8 The pendant should be connected to an isolated power supply and provide an uninterruptable power supply (UPS) to an agreed number of electrical outlets. IPS and UPS sockets should be colour-coded to differentiate them from one another. Additional switched and shuttered sockets, connected to ring circuits, may be provided at the bedhead for portable non-medical equipment.

4.9 The temperature within bed spaces is usually controlled by the ventilation system rather than radiators. Facilities for temperature and humidity adjustment should be provided, to parameters agreed with clinical representatives on the project team. Children should only be placed in bed spaces that provide local temperature control (due to the need to elevate the room temperature for this patient group).

4.10 The ventilation system should include mechanical cooling and provide for a range of temperatures that can be adjusted by staff, taking particular care to establish and accommodate the unusually high heat gains that may be anticipated from medical equipment. The position of ventilation grilles should minimise the risk of patients experiencing discomfort through down drafts.

4.11 The following equipment may be required at the bedside on an intermittent or continuous basis:

- mobile X-ray machine;
- haemodialysis machine;
- haemofiltration machine;
- peritoneal dialysis machine;
- EEG machines;
- electrocardiography machines;
- echocardiography machines;
- transoesophageal echocardiography machines;
- invasive cardiac output monitoring devices;
- ultrasound machines;
- gamma cameras;
- endoscopes (fibre-optic light source);

- defibrillators;
- non-invasive respiratory equipment (continuous positive airway pressure (CPAP)/bi-level positive airway pressure (BIPAP)): this may be mounted on the pendant;
- vacuum dressings.

4.12 A wall-mounted renal dialysis panel with water supply and drainage may be provided at some bed spaces to facilitate haemodialysis. Alternatively, it may be more economical to supply potable water to small water treatment units at the bed space. The specification for the water quality should be agreed with the project team.

4.13 A clock with an elapsed time control should be clearly visible from each bed space.

4.14 The bed space should be a minimum of 25.5 m^2 in order to accommodate the above equipment/ furniture. This will also allow:

- staff access to the patient from all sides of the bed;
- staff to manoeuvre the patient, themselves and equipment safely;
- five members of staff to attend to the patient in an emergency situation;
- two visitors to sit at the bedside.

4.15 All bed spaces should be capable of providing visual privacy and reasonable auditory privacy, when required. All bed spaces should have natural daylight with outside views wherever possible. Artificial lighting should be dimmable and of sufficient strength to enable surgical interventions and response to life-threatening situations at the bedside. Lighting may be provided as part of the pendant system.

4.16 Glass walls (in the case of single-bed rooms) or partitions (in the case of multi-bed areas), which can be obscured for privacy when appropriate, aid observation of patients.

4.17 A ceiling height of 3 m in bed areas is recommended in order to accommodate pendants and ceiling-mounted hoists. The position of overhead equipment requires careful consideration. The construction of the ceiling should take account of weight-bearing requirements.

5 Public spaces

Entrances

5.1 Patients and visitors should not share the same entrance, to ensure that visitors do not observe patients coming in and out of the critical care unit. Deceased patients should be transported using the patients' entrance. Staff may share an entrance with either visitors or patients. However, a dedicated entrance for visitors may provide them with a calmer, less busy environment. Supplies should be delivered via the same entrance used by staff.

5.2 The entrance for visitors requires an intercom-controlled entry system or similar linked to the reception desk and staff communication base(s). CCTV should also be considered, with monitors at the reception desk and staff communication base(s) to assist with identification of visitors out-of-hours.

5.3 Where access control measures are in place, close-proximity cards rather than swipe cards or keypads should be used, as they are easier to clean and offer better infection control.

Reception desk

5.4 The entry system for the visitors' entrance, CCTV monitor, if provided, and a telephone for internal and external calls should be located here. The reception desk should have natural surveillance of the visitors' entrance and/or point of entry to clinical areas.

Visitors' waiting area and associated facilities

5.5 On arrival, visitors will be admitted immediately to the appropriate clinical area or asked to wait in the waiting area. There should be a door between the waiting area and clinical areas, controlled by staff, to prevent visitors wandering into clinical areas. Beverage-making facilities and WCs should be available nearby. The waiting area may include a TV. A separate visitors' sitting room may be of value for those spending long periods of time within the vicinity of the critical care unit.

Visitors' overnight accommodation

5.6 Overnight accommodation for visitors may be provided within the hospital, or the hospital may have an arrangement with a nearby hotel. Where children are being treated, overnight accommodation for parents should be provided. Enlarged single bedrooms provide the option of adding an extra bed for parents to stay overnight.

6 Clinical spaces

Staff communication base(s)

6.1 Ideally, staff at the base(s) should be able to see all multi-bed spaces under their control and the entry point to clinical areas. Control of the visitors' entry system will be transferred from the reception desk to the communication base(s) at night.

6.2 Alarms to signify the failure of medical gas and power outlets within the bed spaces should be located here. Central consoles for multi-parameter patient monitoring equipment should also be located here.

6.3 A telephone for internal and external calls will be required. Task lighting should be provided for use at night to prevent disturbing patients. Each base should be partially enclosed to control noise transfer.

Isolation rooms

6.4 Single-bed rooms with lobbies are required for the isolation of patients to control the spread of infection or for the protection of immuno-suppressed patients.

6.5 Single-bed rooms should be rectangular, not L-shaped, with an entrance wide enough to allow bulky equipment to pass easily – at least a door and a half wide. Care should be taken to ensure that the door opening is sufficient to allow the passage of the bed and equipment.

6.6 The ventilation system should be designed to provide simultaneous source and protective isolation. A balanced supply and extract ventilation to each isolation room and gowning lobby is, therefore, proposed. The lobby, which functions as

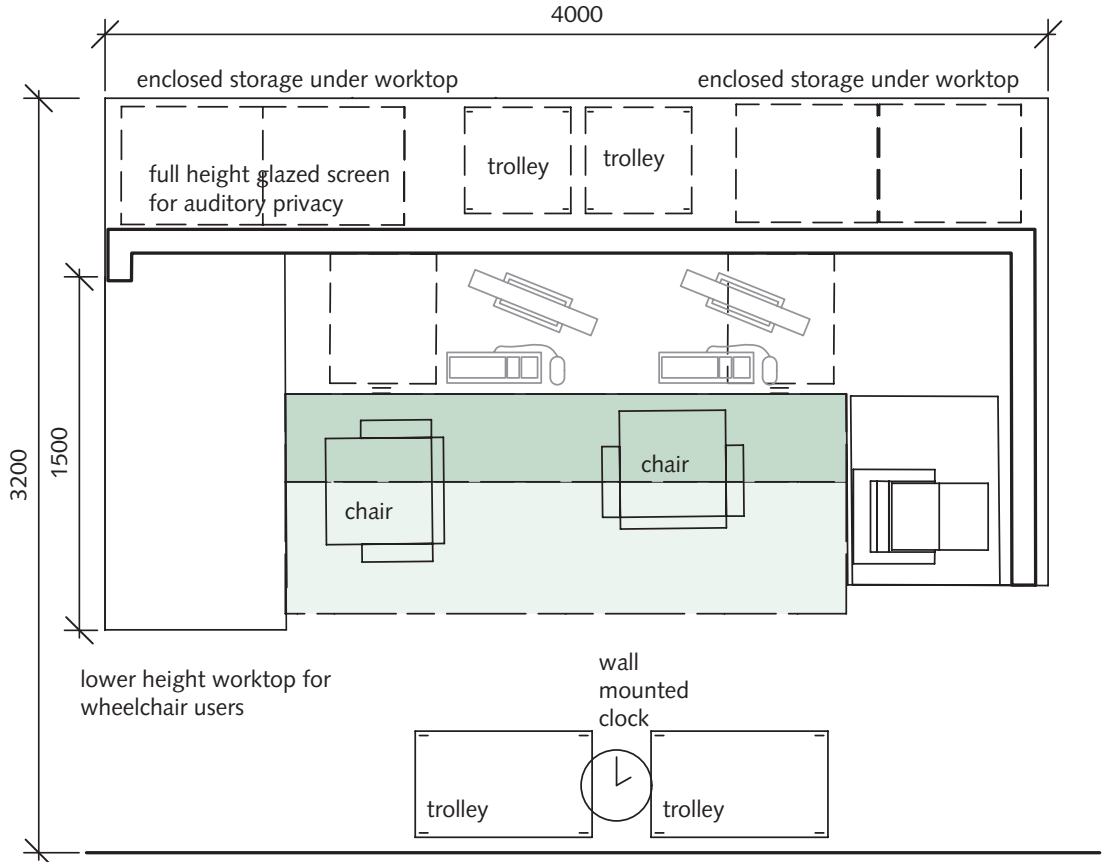

Figure 2 Critical care 2-place staff communication base

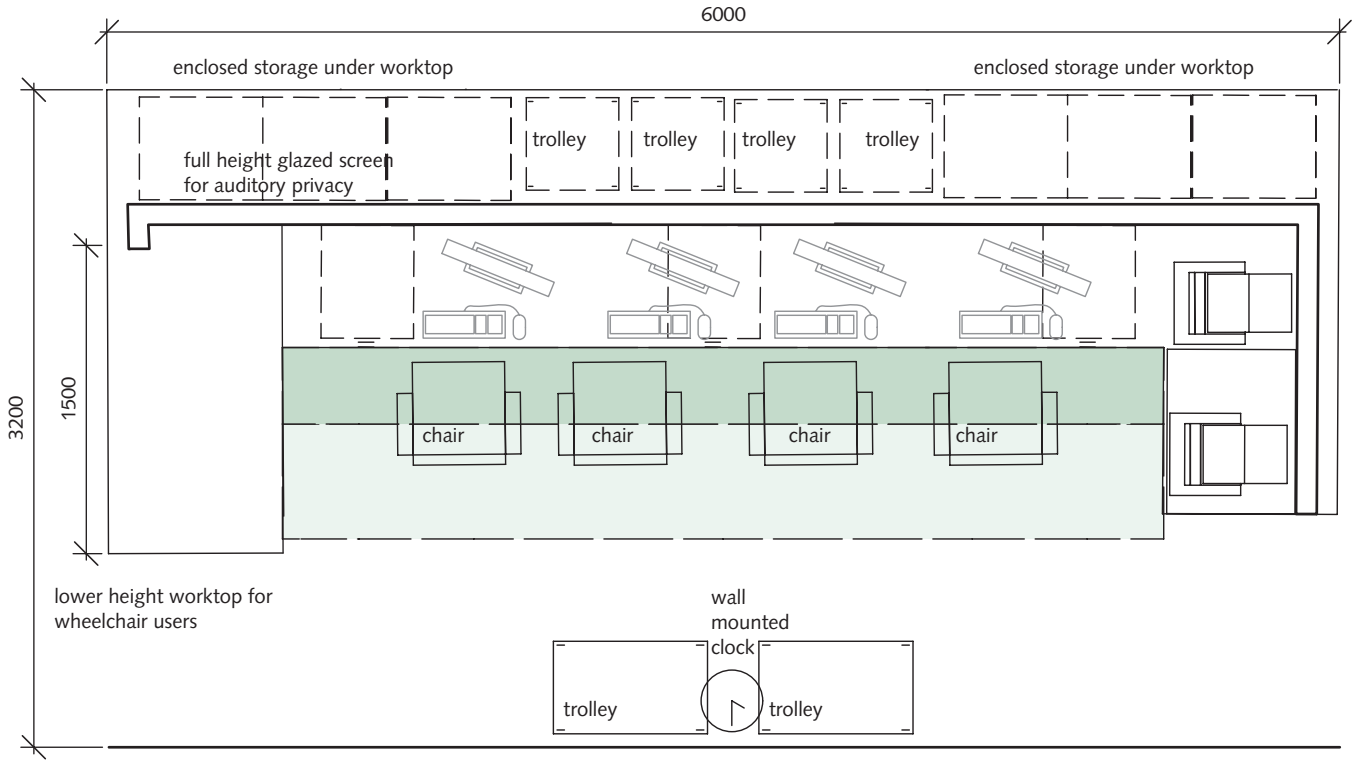

Figure 3 Critical care 4-place staff communication base

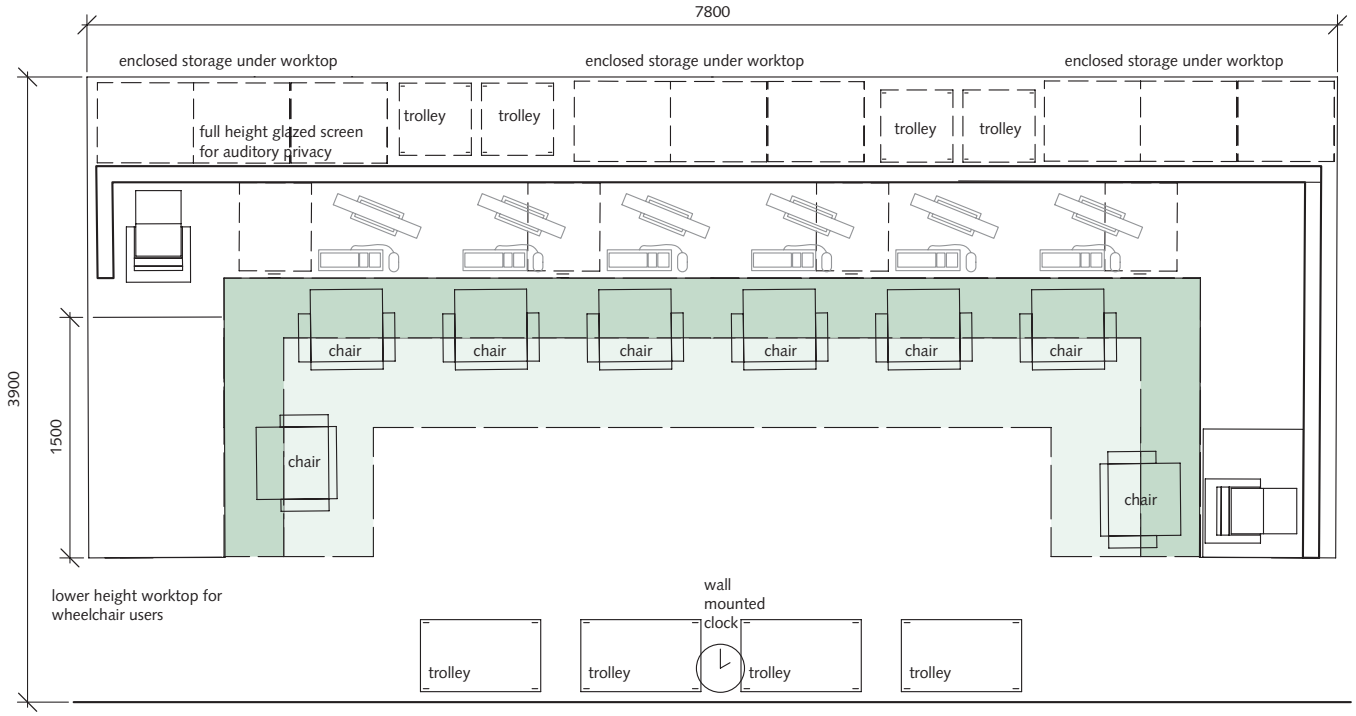

Figure 4 Critical care 8-place staff communication base

an airlock, requires a relatively high and balanced supply and extract air change rate to be effective against airborne organisms moving between circulation areas and isolation rooms.

6.7 Ceilings and windows should be sealed. Doors should be tight-fitting, with seals to minimise air transfer.

6.8 Isolation rooms should have local temperature controls that are accessible to nursing staff and may require humidity within the range 40–60% Rh, depending on the specialty.

6.9 The precise number of isolation rooms will depend on the case mix of the critical care unit. For example, units that routinely admit neutropenic haematology patients may require up to 50% of their beds to be provided as isolation rooms with lobbies. No unit should, however, have less than 20% of their beds as isolation rooms.

Multi-bed areas

6.10 A 2.5 m-wide unobstructed circulation space should be provided at the foot of each bed space. It is imperative to maintain the required bed separation for infection control reasons and to aid positioning of equipment.

6.11 The temperature in the multi-bed areas should be centrally controlled.

6.12 Requirements for scrub troughs should be determined locally based on patient case mix.

6.13 Project teams should select a curtain system that meets the following criteria:

- when the curtains are pulled around the bed space, there should be 100% visual privacy;
- it should be possible to pull the curtains back completely against the wall;

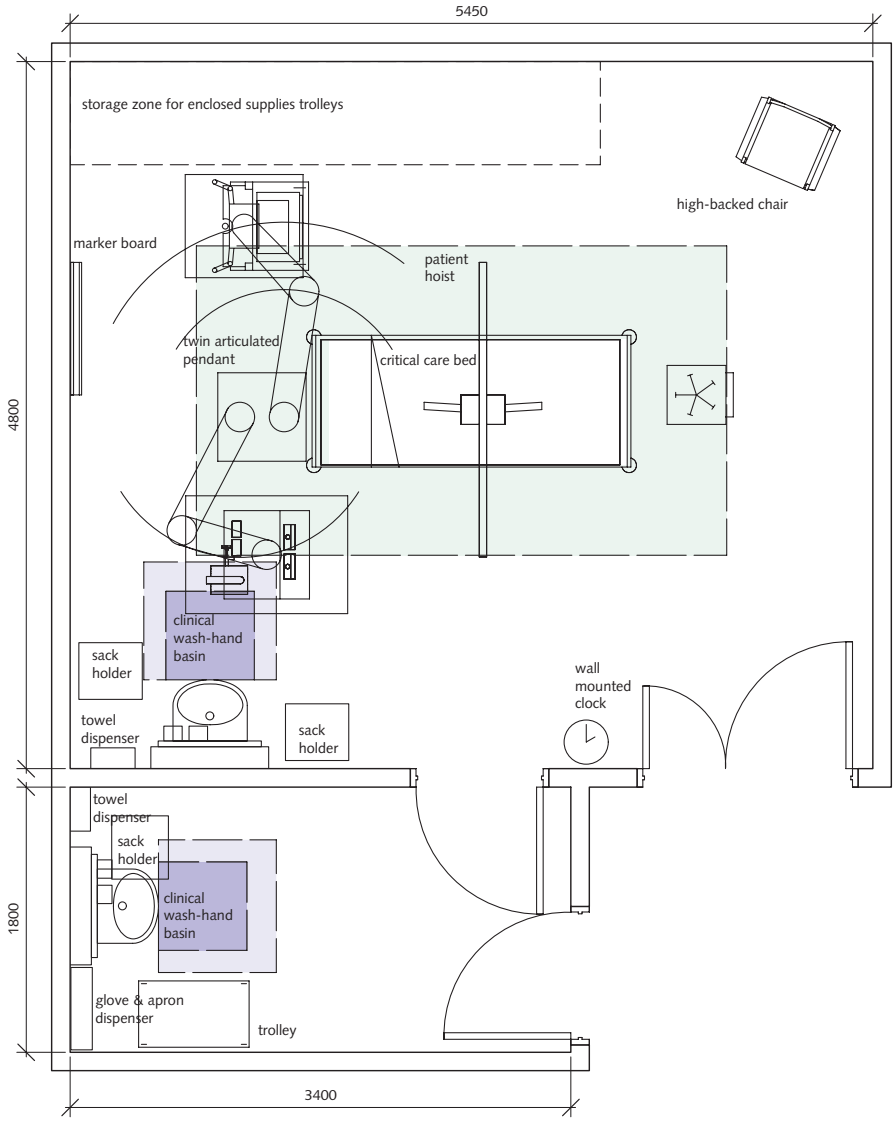

Figure 5 Critical care isolation room and lobby

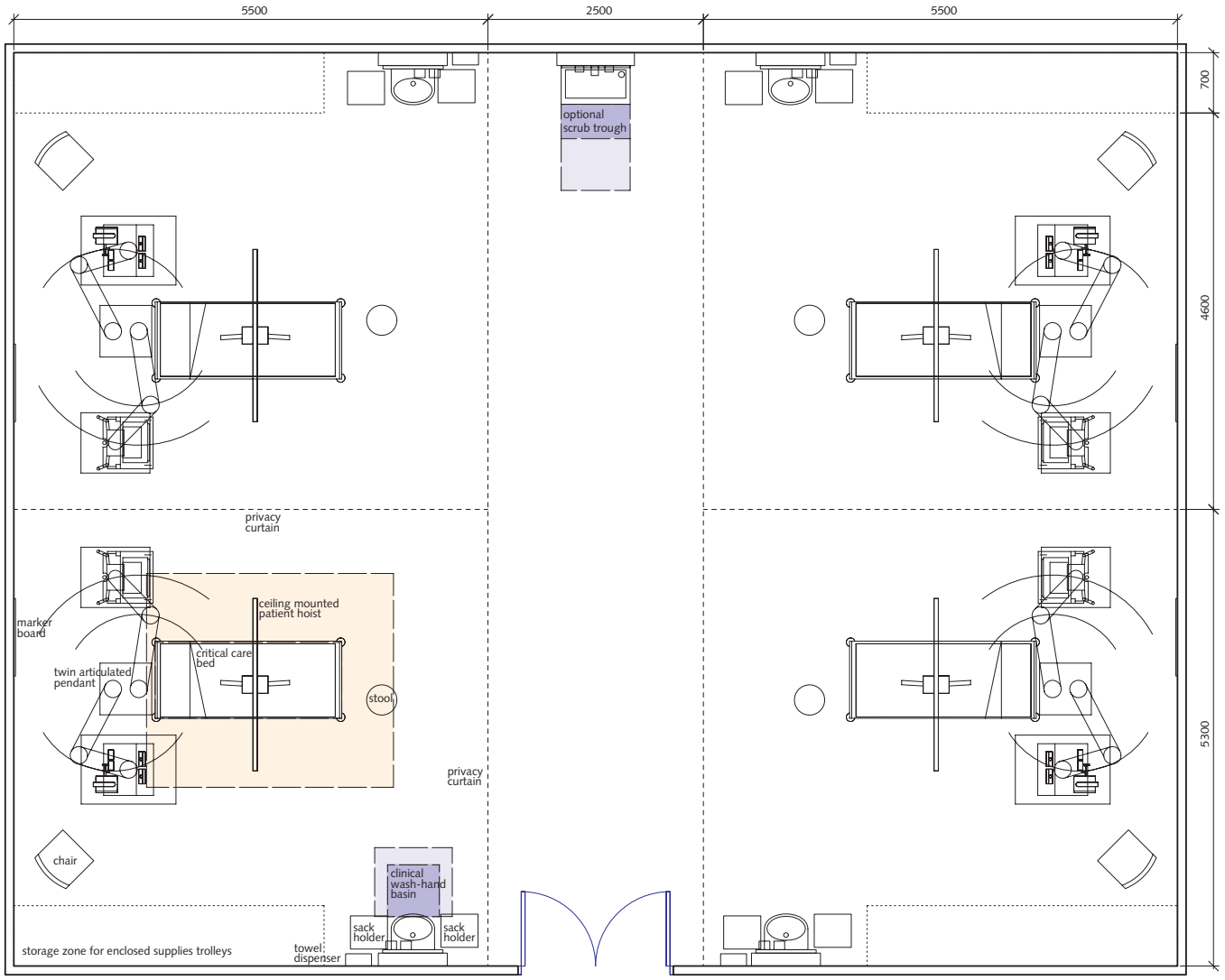

Figure 6 Critical care 4-bed bay

- the density of the curtains should reduce the level of general noise transmitted and also improve the level of auditory privacy in the bed-space;
- the curtains should be easily movable and disposable.

Interview rooms

6.14 Interview rooms should be provided within the vicinity of the bed spaces to enable staff to speak to visitors in privacy. The rooms should be in a quiet location.

7 Clinical support spaces

Ice-making machine bay

7.1 An industrial ice-making machine should be provided to facilitate hypothermic interventions. It should be located in a designated bay.

Storage for bulky consumables, medical gas cylinders, linen and furniture

7.2 The example schedules include a combined storage allowance for bulky consumables, medical gas cylinders, linen and furniture. However, these four categories of item should be stored separately. (It is assumed that non-bulky sterile supplies and consumables are held in the clean utility rooms.)

7.3 The project team should ensure that the provision of standby medical gases reflects the emergency procedures and contingency plans for the unit. The medical gas cylinder store(s) should be easily accessible from clinical areas and enclosed in fire-resisting construction.

7.4 The furniture store(s) will need to accommodate bulky equipment, including mattresses, when not in use, chairs, bariatric equipment and cots.

Clinical equipment store(s)

7.5 A dedicated area should be provided for the storage and charging of transfer equipment (transport trolley, monitors, syringes, ventilators, suction pumps). Dedicated ventilation may be required to remove gases and heat from chargers. An area for hanging endoscopes and transoesophageal echocardiography probes is also required. The clinical equipment store(s) should be within easy access of the bed areas.

Clinical equipment decontamination room

7.6 Clinical equipment should be cleaned following use prior to transfer to the clinical equipment store(s) or, if the equipment requires maintenance, to the equipment servicing room. A clinical equipment decontamination room should be provided for this purpose. This room should be adjacent to the clinical equipment store(s).

Imaging equipment bay

7.7 An open bay should be provided close to the clinical equipment store(s) for the storage of imaging equipment and protective lead aprons. A socket-outlet should be provided for charging equipment.

7.8 Lead aprons should be stored vertically to maintain their protective capability. Suitable wall brackets attached to a load-bearing wall, or mobile stands, are required for this purpose. The bay should also accommodate a mobile X-ray machine, a minimum of one ultrasound machine, and a transoesophageal echocardiography machine. A larger bay is required if mobile image intensifiers are used.

7.9 Regulations pertaining to the use of ionising radiation, such as IR(ME)R 2000 and IRR99, must be complied with.

Resuscitation trolley bays

7.10 It is essential that adequate provision is made for siting resuscitation trolleys within the critical care unit. The precise equipment positioned on these trolleys should be determined locally.

Blood refrigerator bay (optional)

7.11 A blood refrigerator will only be required if a blood store is not available nearby. If provided, the fridge should be located in a designated bay and should be networked to the central system to permit traceability of blood. The use of blood refrigerators is governed by national and local blood transfusion service regulations.

Clinical equipment service room (optional)

7.12 Facilities are required for equipment servicing as defined in equipment manufacturers' user manuals, supplemented by any formally agreed local instructions. A dedicated room should be provided in the critical care unit for this purpose if an existing biomedical engineering workshop is not located nearby. When provided as part of the critical care unit, this room should be adjacent to the clinical equipment decontamination room.

8 Staff spaces

1-person offices

8.1 The clinical director, lead nurse and Faculty of Intensive Care Medicine tutor require dedicated 1-person offices.

Admin areas

8.2 The following staff may require access to a workstation, but these may be provided in an open-plan office environment:

- clinical staff (doctors, nurses, allied health professions);
- outreach staff;
- audit clerk;
- technician;
- secretarial staff;
- IM&T staff;
- organ donation staff;
- research staff.

8.3 Workstations for clinical staff should provide quick and easy access to the patient bed areas in case of an emergency.

Seminar room

8.4 Access to a seminar room within the vicinity of the critical care unit must be provided. An intercom system should be installed between the seminar room and the clinical areas to recall staff in an emergency. The seminar room may double up as a skills laboratory, for example for training in resuscitation, using mannikins, defibrillators, and simulated body parts for venepuncture or suture practice.

Rest rooms

8.5 Staff rest rooms should be located far enough away from patient bed areas for staff to withdraw, but also close enough for them to return quickly to the patient bed areas in case of an emergency. Rest rooms require call systems to recall staff to the clinical areas in case of an emergency.

Changing areas

8.6 Space is required within the changing areas for the storage and disposal of scrub suits and footwear.

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